

**Project Subject/Title: Oak Lk jack pine Regeneration**

**County: Washburn**

**TRS: T41N R13W sec. 18 and 19**

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**Type of Prescription: Herbicide, site scarification**

**Year Initiated: 1993**

**Abstract/Prescription:**

The study was conducted to observe site preparation treatments to control competition and what species composition occurred after the treatment. The study site was blade scarified prior to harvest with primary goal to enhance jack pine regeneration. The 10 acre site was scarified in 1993 and then seeded. The stand was then harvested in late summer of 1993. The other site was scarified and seeded prior to a winter harvest in 1993/94 and herbicide treatment in Sept of 1996. Monitoring was conducted at both sites by establishing transects with plots. At 70 foot intervals on the transect, plots were established ( a .25 meter quadrat was established to observe the herbaceous layer). The shrub layer was observed on 1.25 meter radius plots. Percent cover, frequency and density of plant species was documented at each plot. Monitoring is ongoing since 1997.

**Results:**

- Site 1 (no herbicide) had slightly more shrub, same amount of forbs. The tree regeneration values (oak and birch) before and after did not change.
- Site 2 (herbicide) had less shrubs, same amount of forbs, and more ground moss. The tree regeneration values (oak and birch) slightly decrease after treatment.

**Discussion/Recommendations:**

- Recommend using successive treatments of herbicide.
- Hand release in combination with herbicide used to control competition.

**Site/Condition:**

**HabitatType = Pam/Qgce**

**Covertime: Jack Pine**

**Soils = outwash sands**

**Costs for tractor-crawler (scarification) \$73.50/hr; Man hours \$13.50/hr**

**Enclosed Document**

INTERRIM REPORT November, 1997

## OAK LAKE JACK PINE REGENERATION STUDY

### Study Area

Study site location is in northwestern Washburn County, T41N-R13W, Sections 18 & 19. Thin soils develop outwash sands which are possibly underlain by glacial lacustrine clays. Dominant forest cover is a Pine/Asp (Pam/QGce of Kotar's classification system).

### Land Treatment

Study sites were blade scarified prior to harvest to obtain Jack Pine regeneration. Oak Lake #1 (stand 40, compartment 71) was cut late summer/fall 1993, and Oak Lake #2 (stand ?, compartment 74) was a winter Herbicide treatment (Oak Lake #1 only) was applied September 1996.

### Objective

Long term vegetation recovery after herbicide application is being explored in this study. The hypothesis of No Change will be tested (over time little spp. richness change, spp. recolonize one way or another). Other possible scenarios could be 1) Low density spp. are affected to some degree, 2) Some families are affected more so than others, 3) Possible invasion of annuals in 2nd season, 4) openland vegetation colonize and maintains up to canopy closure. 5) Cryptogams increase coverage and discourages flora establishment

### Vegetation Sampling Methods

At each sampling site a baseline was established with five transects, 660 feet long, laid out perpendicular. Oak Lake #1 transects run north/south from the base line and Oak Lake #2 transects run east/west. Difference between the two sites is to enable the transects full length to be laid out.

Along each of the transect lines at approximately 70 foot intervals eight .25 meter squared quadrats (for a total of 40 per sample site) will be established for herbaceous layer sampling. The shrub layer sampling circular plots of 1.25 meter radius, staggered 4 per transect for a total of 20 per sample site.

Ocular estimates of percent cover for each plant species (including cryptogams) rooted within the quadrat density (number of stems) will be recorded for each point for the herbaceous layer. The same will be recorded shrub quadrats.

### Preliminary Observations

#### Shrub Cover

The 1996 sampling season was post-scarification and pre-herbicide. Oak Lake #1 and Oak Lake #2's shrub cover this year were 16.7% & 23.2% of the total possible, with Oak Lake #1's lower value possibly due to greater either through more area scarified or pre-winter harvesting scuffing up the mineral soil. Evidence of this disturbance is the abundance of invasive *Rubus* spp.. After herbicide application, 1997's shows Oak Lake #1's % of post shrub cover decreased 90% to 1.7%, while Oak Lake #2's stayed approximately the same (23.2%-25.2%).

Contributions of individual spp. to the total cover in 1997 on Oak Lake #2 changed little though a slight increase in Relative Cover for Hazel was observed for all species, except for Jack Pine.

#### Grass/Sedge Cover

Grass/Sedge Cover decreased greatly for Oak Lake #1 (-80%). While for Oak Lake #2, Bluestems and C showed no statistically significant increase though the sum of the remainder of the grass spp. was significant at  $< .008$ . The Relative Moss cover for both sites in 1996 was slight ( $< 0.05\%$ ) though an increase was observed in both for 1997, overall cover contribution was still small (0.01%). Bare ground did not change much on Oak Lake #1, while Oak Lake #2 decreased significantly.



## Forb Cover

Species richness (sum of spp. for all quadrats on a site) in 1996 of 38 spp. was found for both sites. 1997 showed a decrease of 13 spp. & 8 spp. for Oak Lake #1 & Oak Lake #2 respectively. All species recorded for 1997 were low in frequency of occurrence. Unpublished data for Namekagon Barrons Wildlife Area for the 1997 season show a decrease in numbers of composites for clearcut and burned sites on QGce habitat types, so other factors may be important seasonally.

Dominant forb families in both density and cover are Compositae, Ericaceae, Rosaceae, and Liliaceae whose sum of relative cover is plus/minus 65% for both years. Oak Lake #1 experienced a significant decrease for all of the above families except Liliaceae, which doubled in density while its cover stayed the same. Most all plants in 1997 showed stunted growth due to herbicide application.

Oak Lake #2 shows Liliaceae doubling also for density but a decrease in cover. These effects may again reflect unknown seasonal parameters.

Future floristic composition on Oak Lake #1 may be influenced by seed source and physical parameters of the soil. The first few years after treatment may offer a window of opportunity for invasive species or plants with vegetative means of reproduction due to decreased competition so at least 3 years after herbicide application should be observed.

